

**Before the
Consumer Power and Conservation
Financing Authority**

In the Matter of:)

) Docket Number: 2002-07-01

Rulemaking on Establishment)
of Target Reserve Level)

**The California Energy Commission's Response to Questions
Regarding a Target Reserve Level**

The California Energy Commission appreciates the opportunity to present comments to the California Consumer Power and Conservation Financing Authority (Power Authority) on its Rulemaking to establish a reserve margin for its own planning purposes. As indicated in the notice, in February 2002 the Power Authority established an initial planning reserve margin of 15 percent above load for purposes of developing its investment plan. A planning reserve margin is one essential aspect of a reliable and economically sustainable electricity system; yet, erring in either direction can have significant consequences. Inadequate operating reserves can lead to rotating outages, equipment damage, and system collapse. Planning reserves set well above the minimum level can stifle investment, frustrate policy preferences, and raise ratepayer costs. California has experienced consequences in both directions in the last two decades.

1. Considering the fundamental difference between the current generation market and the past, does the historic reserve level reflect the greater reliability risks of the present and future?

A reserve margin (or level) is a measure of the amount of reserve capacity available to cover the possibility of system fluctuations and unexpected emergencies. The Power Authority's target planning reserve margin, a deterministic value, is one way to address supply-adequacy concerns. System planners, and some government agencies, historically determined a minimum reliability target probabilistically. Planners generally stated a reliability standard as the expectation that a loss of load would occur no more frequently than one day in 10 years. More recently, some utilities have explored the possibility of using a value-of-service approach to reliability planning.

In any case, effectively assessing how well a control-area operator's portfolio of capacity resources meets a reliability standard requires a complex and data-intensive simulation of the electricity system. A rigorous reliability analysis considers the dynamic nature of the system, diverse interconnection opportunities, facility-outage uncertainties, local transmission constraints, and differing load characteristics. It also considers the specific attributes that different electricity supplies or load-management options would contribute to system reliability. It should also consider how market imperfections would affect generation availability. Typically a complex analysis will find a different level of reserve

requirements for each control area, rather than a single West-wide or California value. However, even the most sophisticated analysis is only as good as its assumptions.

Although well aware of the consequences of a planning reserve margin that is too low, the Energy Commission also notes that there may be significant negative consequences from a target reserve margin that is too high, assuming it is met only through long-term commitments. For example, a high reserve margin can dampen investment incentives, cost more than consumers are willing to pay, and frustrate the development of important opportunities (including renewables and demand response) that depend on forthcoming regulatory decisions.

As the Power Authority notes in its order, recent changes in the electricity market, and both related and unrelated changes in financial markets, have significantly affected how we might evaluate reserve margins. In addition, power plant outage rates have recently exceeded long-term averages. At the same time, the remarkable events that began in 2000 and continued into 2001 have not recurred to date. This is because significant regulatory, administrative, legislative, and investment actions have stemmed the price volatility and market instability of that period.

Moreover, proceedings currently before the California Public Utilities Commission and the Federal Energy Regulatory Commission will dramatically alter the regulatory landscape, and the financial climate in the very near future. These proceedings are considering significant changes in market structure, utilities' obligations with respect to resource procurement, and opportunities for consumers to participate in demand-responsiveness programs.

Even before the outcome of these important regulatory proceedings is clear, the amount of capacity under construction—and on schedule—is expected to bring statewide planning reserves above 15 percent of load by 2005. The Energy Commission believes this would provide a much-needed cushion. Recognizing that California has weathered the last two summers with reserves below 15 percent, and given the status of ongoing regulatory proceedings and power plant construction, the Energy Commission believes that the Power Authority should continue to use a minimum planning reserve target of 15 percent. Once the market structure within which the state will be operating is clear and the utility procurement rules are in place, a reexamination of the Power Authority's target reserve margin will be timely. The Energy Commission is prepared to assist in that effort.

2. Given the recent cancellations and delays, and the uncertainty of the financial community, how many of the proposed plants will actually come on line, and under what terms and conditions?

California and the rest of the western U.S. have seen a "gold rush" in the last few years—over 30,000 MW of projects have been proposed in California since the late 1990s and an additional 75,000 MW in other western states. The capacity of these proposed projects far exceeds demand-growth expectations, so it is not unreasonable

to see an adjustment in development levels. In such a climate, financial uncertainty is a serious concern for a number of developers and has affected the development prospects of some proposed generation projects.

Nevertheless, the Energy Commission believes, based on a review of the individual projects, that about 11,500 MW of new generation will come on line by July 31, 2005, despite the numerous cancellations and delays of proposed generation projects. Most of these projects are already under construction, and it is our understanding that about 7,500 MW of this capacity is covered under power-purchase agreements with the California Department of Water Resources' California Energy Resources Scheduling Division.

3. What will the lingering effects of behavioral conservation be, and what are the permanent effects?

Californians reduced their electricity demand in 2001 primarily through two forms of response. Consumers either conserved through behavior change (e.g., turning up the thermostat to reduce air conditioning use or changing operating schedules), or invested in more efficient equipment (e.g., replacing an older central air conditioning unit with a high efficiency unit).

The kinds of conservation strategies that consumers pursue significantly affect the persistence of these demand reductions into the future. For example, investments in high-efficiency equipment will generally reduce energy consumption and peak demand over the useful life of those investments. Likewise, demand-management technologies, such as energy-management control systems and advanced interval meters equipped with two-way communications, will enable customers to shift loads in response to prices well into the future. Behavioral or operational changes, however, are less likely to persist over time without efforts to sustain them.

The Energy Commission believes it is reasonable to assume that no more than about half of the aggregate peak demand reductions observed in 2001 will persist for many years. Based on recent studies by Lawrence Berkeley National Laboratory (LBNL) and the Energy Commission's own analysis of energy consumption patterns, it appears that 25-30 percent of the customer load reductions observed in 2001 were the result of energy efficiency investment and on-site generation gains. Behavior changes contributed the other 70-75 percent of the observed load reductions in 2001. Follow-on research in 2002-03 will further refine these estimates and analyze their proportional contributions to future load reductions.

4. What impact will the significant rate increases have on load and consumption patterns?

Isolating the effects of price on demand from those associated with responses to fear of blackouts, public calls for conservation, efficiency programs, bill incentives, and other influences is a significant challenge given the nature of the crisis. However, the Energy

Commission currently has studies underway that it hopes will help sort out these influences.

Nevertheless, the Energy Commission believes that consumers should have the opportunity to respond to prices, and that if they do, significant demand response would occur. In this regard, many consumers already have interval meters installed on their premises, and, once the CPUC completes its demand-responsive, rate-design proceeding, those consumers will have the tools to respond to varying prices.

Clearly, the magnitude of demand response in California will depend on tariff design and the composition of the electricity customers covered by those tariffs. Georgia Power's experience has shown that an effectively designed dynamic-pricing tariff (one form of time-varying prices) leads to predictably lower peak loads than would have occurred in the absence of such a tariff.

One important consideration is that demand response may be less expensive than new generating facilities are, in part, because it can reduce required reserves. This happens in two ways. First, the California Independent System Operator's Market Analysis Department has argued that reserves margins should be set at a higher level to reduce the probability that tight conditions will allow generators to exert market power.¹ Others argue that demand response can be a more effective, less expensive way to reduce the opportunity for generators to exert market power because suppliers can no longer count on an inelastic demand curve to hold up market prices. By using demand response, rather than supply resources, to reduce market-power opportunities, consumers can avoid the cost of a planning reserve target set above the level that engineering-based assessments would call for.

Second, price-responsive demand, induced through dynamic tariffs and demand-bidding programs, encourage all participants to reduce demand somewhat when prices are high and supply-demand conditions are tight. When many customers automatically respond to these circumstances by reducing peak load, reserve requirements (which are set at a percent of load) also go down in absolute terms. The state needs to conduct further research and assessments in order to account for the fraction of peak loads that would decline in response to price signals reflecting tight supply-demand conditions.

The Energy Commission is committed to continued enhancement of consumer demand-responsiveness capabilities. In this regard, the Energy Commission, the CPUC, and the Power Authority are working jointly to implement dynamic pricing tariffs and programs.

¹ CAISO, Department of Market Analysis Study of Reserve Requirements, November 2001.

5. What impact will the new market design elements approved by FERC on 7/17/02 and those still pending have on system loads and procurement policies?

California is six to twelve months away from establishing the parameters of its revised market design. The four market-design features with the greatest impact on target reserve margins are likely to be locational pricing, resource procurement, incentives for more rapid transmission development, and demand responsiveness. The Energy Commission expects these changes to create new incentives to enhance supply and reduce demand.

In summary, the Energy Commission notes that the generation supply outlook has been steadily improving since the crisis began in the fall of 2000, and the status of current construction activities is favorable. Furthermore, while the effects of behavioral conservation efforts have declined over time, conservation investments will persist for many years. Finally, the ongoing proceedings before the CPUC and the FERC will change the market and regulatory structure within which the state's utilities will operate. Among the significant issues before the CPUC is the demand-responsiveness rulemaking which could fundamentally change what constitutes an adequate planning reserve margin. The Energy Commission believes that, given these circumstances, the Power Authority should continue to use the 15 percent minimum planning reserve margin pending the outcome of important ongoing proceedings.